

TRANSLATION

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference PCT05-0004	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. PCT/JP2005/002529	International filing date (<i>day/month/year</i>) 10.02.2005	Priority date (<i>day/month/year</i>) 10.02.2004
International Patent Classification (IPC) or national classification and IPC C07B37/04 (2006.01), C07B49/00 (2006.01), C07C1/32 (2006.01), C07C13/28 (2006.01), C07C13/40 (2006.01), C07C15/02 (2006.01)		
Applicant JAPAN SCIENCE AND TECHNOLOGY AGENCY		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of <u>8</u> sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising: a. <input checked="" type="checkbox"/> (sent to the applicant and to the International Bureau) a total of <u>9</u> sheets, as follows: <input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions). <input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box. b. <input type="checkbox"/> (sent to the International Bureau only) a total of _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).
4. This report contains indications relating to the following items: <input checked="" type="checkbox"/> Box No. I Basis of the report <input type="checkbox"/> Box No. II Priority <input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability <input checked="" type="checkbox"/> Box No. IV Lack of unity of invention <input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement <input type="checkbox"/> Box No. VI Certain documents cited <input type="checkbox"/> Box No. VII Certain defects in the international application <input type="checkbox"/> Box No. VIII Certain observations on the international application

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/JP	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2005/002529

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language _____, which is the language of a translation furnished for the purposes of:
- ☐ international search (Rule 12.3 and 23.1(b))
- ☐ publication of the international application (Rule 12.4)
- ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):
- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1-3, 5-6, 8-72 as originally filed/furnished
- pages* 4, 7-7/1 received by this Authority on 14.09.2005
- pages* _____ received by this Authority on _____
- ☒ the claims:
- nos. 2-5, 7-10, 12-16, 18-21 as originally filed/furnished
- nos.* _____ as amended (together with any statement) under Article 19
- nos.* 1, 6, 11, 17 received by this Authority on 14.09.2005
- nos.* _____ received by this Authority on _____
- ☐ the drawings:
- sheets _____ as originally filed/furnished
- sheets* _____ received by this Authority on _____
- sheets* _____ received by this Authority on _____
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages _____
- ☐ the claims, nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to sequence listing (*specify*): _____
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages _____
- ☐ the claims, nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

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Box No. IV

Lack of unity of invention

1. ☐ In response to the invitation to restrict or pay additional fees the applicant has:
- ☐ restricted the claims.
 - ☐ paid additional fees.
 - ☐ paid additional fees under protest.
 - ☐ neither restricted the claims nor paid additional fees.
2. ☒ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is:
- ☐ complied with.
 - ☒ not complied with for the following reasons:

The feature that is common to the inventions set forth in 1 to 5, the inventions set forth in claims 6 to 10, the inventions set forth in claims 11 to 16, and the inventions set forth in claims 17 to 21 is the method for producing aromatic compounds by reacting one of the halogen compounds or sulfonate compounds that are set forth in the present application with an aromatic metal compound in the presence of an iron catalyst and a diamine compound; however, said method is well known, as disclosed in documents A and B indicated below. Such being the case, the method in question does not define a contribution over the prior art, and thus does not constitute a special technical feature as stipulated in Rule 13.2 of the Regulations Under the PCT.

[Refer to the Supplemental Box]

4. Consequently, this report has been established in respect of the following parts of the international application:

☒ all parts.

☐ the parts relating to claims Nos. _____

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Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
1.	Statement		
	Novelty (N)	Claims <u>6-21</u>	YES
		Claims <u>1-5</u>	NO
	Inventive step (IS)	Claims <u>11-21</u>	YES
		Claims <u>1-10</u>	NO
	Industrial applicability (IA)	Claims <u>1-21</u>	YES
		Claims _____	NO
2.	Citations and explanations (Rule 70.7)		
	Document 1: JP 2000-229243 A (Tosoh Corp.), 22 August 2000		
	Document 2: US 2003/0220498 A1 (FURSTNER et al.), 27 November 2003		
	Document 3: JP 2001-293375 A (Tosoh Corp.), 23 October 2001		
	Document 4: JP 2000-344727 A (Tosoh Corp.), 12 December 2000		
	Documents 1 to 4 are cited in the international search report.		
	A.		
	The inventions set forth in claims 1 to 5 lack novelty and do not involve an inventive step in the light of documents 1 to 2.		
	Documents 1 to 2 disclose methods for producing aromatic compounds by reacting one of the halogen compounds or sulfonate compounds that are set forth in the present application with an aromatic magnesium compound in the presence of an iron catalyst and a diamine compound.		

Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
B.	<p>The inventions set forth in claims 6 to 10 do not involve an inventive step in the light of documents 1 to 4.</p> <p>Documents 1 to 2 disclose methods for producing aromatic compounds by reacting one of the halogen compounds or sulfonate compounds that are set forth in the present application with an aromatic zinc compound in the presence of an iron catalyst and a diamine compound.</p> <p>Meanwhile, documents 3 to 4 disclose methods for producing aromatic zinc compounds by reacting one of the aromatic magnesium compounds that are set forth in the present application with a zinc compound in the presence of a diamine compound. Such being the case, it cannot be considered to be difficult for a person skilled in the art to conceive of employing the method in question in order to produce the aromatic zinc compounds that are disclosed in documents 1 to 2.</p> <p>C.</p> <p>The inventions set forth in claims 11 to 16 are novel and involve an inventive step in relation to documents 1 to 4.</p> <p>That is to say, the method for producing aromatic compounds via a step for reacting one of the aromatic lithium compounds that are set forth in the present application with a zinc compound in the presence of a diamine compound in order to obtain a reaction mixture and a step for reacting one of the halogen compounds or sulfonate compounds that are set forth in the present application with the aforementioned reaction mixture in the presence of an iron catalyst, wherein the</p>

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement

aforementioned reaction mixture that comprises a zinc compound and an aromatic lithium compound is subsequently reacted with one of the Lewis acid metal compounds that are set forth in the present application, is not disclosed in any of documents 1 to 4, and would not have been obvious to a person skilled in the art.

D.

The inventions set forth in claims 17 to 21 are novel and involve an inventive step in relation to documents 1 to 4.

The method for producing aromatic compounds by reacting one of the halogen compounds or sulfonate compounds that are set forth in the present application with an aromatic zinc compound in the presence of an iron catalyst and a diamine compound, wherein the aforementioned aromatic zinc compound is reacted with one of the magnesium compounds that are set forth in the present application, is not disclosed in any of documents 1 to 4, and would not have been obvious to a person skilled in the art.

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

The Cover Sheet

International Patent Classification (IPC) or national
classification and IPC

**C07C15/107 (2006.01), C07C15/12 (2006.01), C07C17/263
(2006.01), C07C22/08 (2006.01), C07C41/30 (2006.01),
C07C43/21 (2006.01), C07C67/293 (2006.01), C07C67/343
(2006.01), C07C69/157 (2006.01), C07C69/24 (2006.01),
C07C69/612 (2006.01), C07C69/76 (2006.01), C07C253/30
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C07C255/50 (2006.01), C07D209/08 (2006.01), C07D211/34
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C07D307/20 (2006.01), C07D407/06 (2006.01), C07F7/08
(2006.01), C07J9/00 (2006.01), B01J31/20 (2006.01),
B01J31/22 (2006.01), B01J31/30 (2006.01), C07B61/00
(2006.01)**

Supplemental Box

Box IV.3

As a result, there is no technical relationship involving one or more of the same or corresponding special technical features among the abovementioned four groups of inventions; consequently, the present international application sets forth four groups of inventions that are not linked so as to form a single general inventive concept.

Document A: JP 2000-229243 A (Tosoh Corp.), 22 August 2000

Document B: US 2003/0220498 A1 (FURSTNER et al.), 27 November 2003